

CLAIMS:

1. A method of controlling a motor driven throttle valve, in which the opening of throttle valve is controlled by controlling the supply capability to a motor for driving the
5 throttle valve based on the target opening and the actual opening of throttle valve,

wherein the supply capability to said motor is corrected according to the temperature of said motor.

10 2. The method of controlling the motor driven throttle valve according to claim 1, wherein said supply capability to the motor is obtained the deviation between said target opening and the actual opening by carrying out the PID operation. (12)

15 3. The method of controlling the motor driven throttle valve according to claim 1, wherein the temperature of the winding of said motor is used as the temperature of said motor.

4. The method of controlling the motor driven throttle valve
20 according to claim 1, wherein the temperature of the housing of the motor is used as the temperature of said motor.

5. The method of controlling the motor driven throttle valve according to claim 1, wherein the temperature of the engine

cooling water is used as the temperature of said motor.

6. A control device for a motor driven throttle valve in which
the opening of the throttle valve are controlled by the motor,
5 and the control amount of an accelerator pedal is included as
one of control parameters for determining the supply capability
to the motor,

wherein the throttle valve is fixed to the opening when
control parameter for determining the supply capability to the
10 motor is maintained to a constant value, and the rate of change
of the supply electric current and the applied voltage to the
motor with respect to time when the accelerator pedal is stepped
down under such a condition is different depending on the
temperature of the motor.

15

7. The control device for a motor driven throttle valve
according to claim 6, wherein the temperature of the winding
of said motor is used as the temperature of said motor.

- 20 8. The control device for a motor driven throttle valve
according to claim 6 , wherein the temperature of the housing
of the motor is used as the temperature of said motor.

9. The control device for a motor driven throttle valve

according to claim 6, wherein the temperature of the engine cooling water is used as the temperature of said motor.

10. A control device for a motor driven throttle valve in which
5 the open and close of a throttle valve are controlled by a motor driven according to opening instruction signal of the throttle valve, said control instruction signal is corrected by performing the feedback of the output of the opening sensor for detecting said throttle valve opening,

10 wherein a specific value of said control instruction signal is different according to the temperature condition of said motor, when the specific value is provided as said control instruction signal with the feedback of the output of said throttle opening sensor invalidated.

15

11. A method of measuring the temperature of a throttle valve driving motor including a sensor for measuring the electric current which flows in the motor for driving the throttle valve,
wherein the temperature of said motor is estimated based
20 on the voltage applied to said motor and the current value measured by said sensor when within the range of a fixed time period and the opening of the throttle valve is within a fixed range.

12. A method of measuring the temperature of a throttle valve driving motor including a sensor for measuring the electric current which flows in the motor for driving the throttle valve,
wherein the temperature of said motor is estimated based
5 on the voltage applied to said motor and the current which flows in the motor when the opening of said throttle valve is controlled to be mechanically fully closed or opened.

13. A method of measuring the temperature of a motor,
10 wherein the temperature of said motor is estimated based on the voltage applied to said motor and the current which flows in said motor.

14. A method of measuring the temperature of a throttle valve driving motor of an automobile,
15 wherein the temperature of said motor is estimated based on the voltage applied to said motor and the current which flows in said motor when said automobile is driven at the fuel cut when decelerating.

20
15. A control device for a motor driven throttle valve in which the opening of the throttle valve is controlled by the motor, further comprising a compensator for compensating the supply capability so that the opening of the throttle valve can

not change even if the impedance of said motor winding and/or the temperature of said motor change with control parameters for determining the supply capability to said motor being maintained to a constant value.

5

16. A control device for a motor driven throttle valve in which the opening of the throttle valve is controlled by the motor, further comprising a compensator for compensating the supply capability so that the opening of the throttle valve can be 10 maintained at the same opening even if another resistor is added to the energizing circuit of said motor with control parameters for determining the supply capability to said motor being maintained to a constant value.

15 17. A control device for a motor driven throttle valve, comprising a throttle valve for controlling the air flow amount supplied to an engine, a microcomputer, a motor for driving said throttle valve to open and close, and a drive circuit for inputting a signal from said microcomputer and controlling the 20 state of energizing of said motor,

wherein said microcomputer has a compensator for compensating the supply capability so that the opening of the throttle valve can not change even if the impedance of said motor winding and/or the temperature of said motor change with control

parameters input to said microcomputer being maintained to a constant value.

18. A control device for a motor driven throttle valve,
5 comprising a throttle valve for controlling the air flow amount supplied to an engine, a microcomputer, a motor for driving said throttle valve to open and close, and a drive circuit for inputting a signal from said microcomputer and controlling the state of energizing of said motor,
- 10 wherein said microcomputer has a compensator for compensating the supply capability so that the opening of the throttle valve can be maintained at the same opening even if another resistor is added to the energizing circuit of said motor with control parameters input to said microcomputer and
15 the temperature of said motor being maintained to a constant value.

19. An automobile provided with a control device for a motor driven throttle valve, in which the opening of the throttle valve are controlled by the motor, and the engine speed changes according to the opening of said throttle valve,
20 wherein the engine speed does not change even if the impedance of said motor winding and/or the temperature of said motor change with control parameters for determining the supply

capability to said motor being maintained to a constant value.

20. An automobile provided with a control device for a motor driven throttle valve including an air flow sensor for detecting 5 the air flow amount which changes according to the opening of the throttle valve, in which the opening of the throttle valve are controlled by the motor,

wherein the output of said air flow sensor does not change even if the impedance of said motor winding and/or the 10 temperature of said motor change with control parameters for determining the supply capability to said motor being maintained to a constant value.

21. An automobile comprising an engine speed sensor for 15 detecting engine speed, a throttle valve for controlling the air flow amount supplied to an engine, a microcomputer, a motor for driving said throttle valve to open and close, and a drive circuit for inputting a signal from said microcomputer and controlling the state of energizing of said motor,

20 wherein the output of said engine speed sensor does not change even if the impedance of said motor winding and/or the temperature of said motor change with control parameters input to said microcomputer being maintained to a constant value.

22. An automobile comprising an engine speed sensor for detecting engine speed, a throttle valve for controlling the air flow amount supplied to an engine, a microcomputer, a motor for driving said throttle valve to open and close, and a drive circuit for inputting a signal from said microcomputer and controlling the state of energizing of said motor,

wherein the output of said air flow sensor does not change even if the impedance of said motor winding and/or the temperature of said motor change with control parameters for determining the supply capability to said motor being maintained to a constant value.

23. An automobile in which the opening of the throttle valve are controlled by the motor, and the engine speed changes according to the opening of said throttle valve,

wherein the engine speed does not change even if another resistance is added to the energizing circuit of said motor with control parameters for determining the supply capability to said motor being maintained to a constant value.

20

24. An automobile including an air flow sensor for detecting the air flow amount which changes according to the opening of the throttle valve, in which the opening of the throttle valve are controlled by the motor, and the engine speed changes

THE UNITED STATES PATENT AND TRADEMARK OFFICE

according to the opening of said throttle valve,
wherein the output of said air flow sensor does not change
even if another resistance is added to the energizing circuit
of said motor with control parameters for determining the supply
5 capability to said motor being maintained to a constant value.

25. An automobile comprising an engine speed sensor for
detecting engine speed, a throttle valve for controlling the
air flow amount supplied to an engine, a microcomputer, a motor
10 for driving said throttle valve to open and close, and a drive
circuit for inputting a signal from said microcomputer and
controlling the state of energizing of said motor,

wherein the output of said engine speed sensor does not
change even if another resistor is added to the energizing
15 circuit of said motor with control parameters input to said
microcomputer being maintained to a constant value.

26. An automobile comprising an air flow sensor for detecting
the air flow amount supplied to an engine, a throttle valve for
20 controlling the air flow amount supplied to an engine, a
microcomputer, a motor for driving said throttle valve to open
and close, and a drive circuit for inputting a signal from said
microcomputer and controlling the state of energizing of said
motor,

wherein the output of said air flow sensor does not change even if another resistor is added to the energizing circuit of said motor with control parameters for determining the supply capability to said motor being maintained to a constant value.

5

27. A control method for a motor driven throttle valve in which the opening of the throttle valve is controlled by the motor,

wherein supply capability to said motor increases as the temperature of said motor increases with control parameters for 10 determining the supply capability to said motor being maintained to a constant value.

28. A control method for a motor driven throttle valve including an air flow sensor for detecting the air flow amount 15 which changes according to the opening of the throttle valve, in which the opening of the throttle valve is controlled by the motor,

wherein supply capability to said motor increases only by the amount necessary to keep the output of said air flow sensor 20 constant as the temperature of said motor increases with control parameters for determining the supply capability to said motor being maintained to a constant value.

29. A control method for an automobile provided with a motor

driven throttle valve controller comprising an engine speed sensor for detecting engine speed, a throttle valve for controlling the air flow amount supplied to an engine, a microcomputer, a motor for driving said throttle valve to open and close, and a drive circuit for inputting a signal from said microcomputer and controlling the state of energizing of said motor,

wherein the supply capability to said motor increases as the temperature of said motor rises so that the output of the engine speed sensor may not change with control parameters input to said microcomputer being maintained to a constant value.